

The Changing Ecosystem

Objectives

Students Will Be Able To describe the Eocene ecosystem, including organisms living in the ecosystem, as well as physical factors with which they interact.

SWBAT describe how the ecosystem in this part of Colorado has changed over time, and why.

SWBAT explain how fossils were formed in the Florissant area.

Inquiry Questions

1. What evidence do scientists have that ecosystems have changed over time?
2. Why is it important for scientists to know what the land was like 35 million years ago?

Materials

- ♦ *Views of the National Parks* CD
- ♦ [Two Column Notes worksheet](#)
- ♦ [Self-Assessment Questions](#)
- ♦ [Florissant Series of Events Chain worksheet](#)

Procedure (Part One - The Eocene Ecosystem)

1. Direct students to the "Tours" section of the Florissant module. (On the Introduction page, you will see the word "Tours" in three different places. Click on any one of these.)
2. Guide the class to the tour of "The Eocene Epoch." Ask students to click on the five different sections of the illustration of "Eocene Ecosystems," (Lake Environment, Sequoia Forest, Between Tours and Pools, Grasslands, and Slopes of the Volcanic Complex.) Students should take notes using the [Two Column Notes](#) handout as they explore. The sections listed above are the "Main Ideas."
3. Project: Based on their notes, ask small groups of students to create a visual representation of the Eocene ecosystem, including organisms living in the ecosystem, as well as physical factors with which they interact. Brainstorm what this might look like (examples could include a poster, diorama, a map, or a dramatic representation.) Encourage students to be as creative as possible.
4. After projects have been created, allow students an opportunity to share their work. Encourage students to self-assess their work using the [Self-assessment Questions](#).

Procedure (Part Two - Formation of Fossils)

1. From the "Eocene Epoch" page, direct students to click on the first box (Eocene: Volcanic Activity.) Continue to click on the first box on each page. This will take you through eight pages, which describe how the Florissant fossils were formed.
2. Complete the [Florissant Series of Events Chain](#) worksheet. Depending on age and/or ability, ask students to write a sentence or draw a picture that illustrates what happened at each step of fossil formation.

Procedure (Part Three - Recent Times Ecosystem)

1. Guide the class to the tour of "Recent Times." There is quite a bit of information here. Allow students some time to freely explore.
2. Direct students to the "Present Day Ecosystem" link. Ask them to spend some time exploring the Naturalist Notes, looking for similarities and differences between "Recent Times" and "The Eocene Epoch."
3. Numbered Heads Together: Divide students into groups of four, assigning students the numbers 1 through 4 within each group.
4. You will ask the groups a series of questions. After each question the groups should put their heads together, hold a whispered discussion about the question, and make sure each member of the group is ready to share an answer if called upon.
5. After groups have had a bit of time to discuss each question, randomly call a number (1 through 4.) Each student with that number should stand up. Call on these students to share the results of their group's discussion.

6. Sample Questions:

- ◆ What plants were evident in the Eocene Epoch?
- ◆ What plants live in this area during recent times?
- ◆ Why do you think these plants are so different?
- ◆ What animals were evident during the Eocene Epoch?
- ◆ What animals live in this area during recent times?
- ◆ Why do you think these animals are so different?
- ◆ Based on what you have learned, why has the ecosystem in this area changed so much over the years?
- ◆ Based on what you have learned, how do scientists know this ecosystem has changed?
- ◆ Do you think the ecosystem will continue to change? Why or why not?
- ◆ How do you think it might change?

Key Vocabulary

- ◆ Perimineralization
- ◆ Lahar
- ◆ Pumice
- ◆ Gradient
- ◆ Montane
- ◆ Pollinators

Discussion Questions

1. What was the ecosystem like during the Eocene Epoch?
2. What evidence did scientists use to determine this?
3. Why is it important to know how ecosystems have changed over the years?
4. What can scientists learn from studying fossils?
5. How were the fossils of the Florissant area formed?
6. How do scientists know how these fossils were formed? What evidence do they have?

Assessment

Students Will Be Assessed On ...

1. Participation in classroom discussion and other activities.
2. Completed Two Column Notes worksheet.
3. Completed Florissant Series of Events Chain.
4. Completed Visual Representation of the Eocene Epoch, including self assessment.

Differentiation

To best meet all students' needs, we suggest ...

1. Heterogeneous grouping for the Visual Representation project and Numbered Heads Together so that more advanced students can be of help to their teammates.
2. Providing sentence starters or fill in the blank sentences on the Two Column Notes and Florissant Series of Events Chain worksheets.